USDA
NATURAL RESOURCES
CONSERVATION SERVICE

MARYLAND CONSERVATION
PRACTICE STANDARD

# WASTE UTILIZATION

CODE 633
(Reported by Acre)

## DEFINITION

Using agricultural wastes such as manure and wastewater, or other organic residues.

## PURPOSES

This practice may be applied for one or more of the following purposes:

1. To provide plant nutrients for production of crops, forage, fiber, and forest products;

2. To protect water quality;

3. To improve or maintain soil structure;

4. To provide feed for livestock;

5. To provide a source of biomass for energy production.

## CONDITIONS WHERE PRACTICE APPLIES

This practice applies where agricultural wastes, including animal manure and contaminated water from livestock and poultry operations, solids and wastewater from municipal treatment plants, and agricultural processing residues, are utilized.

This practice also includes temporary stacking of dry animal waste when pads, liners, or permanent storage facilities are not required.

## CONSIDERATIONS

### General Considerations

Waste utilization is an integral part of a more complete animal waste management system or Comprehensive Nutrient Management Plan (CNMP). Waste utilization serves as the link between the waste storage and handling portion of a waste management system plan and the nutrient management portion. A good waste management system helps ensure that adequate waste storage and collection facilities are available to properly manage waste between the periods of land application called for in the nutrient management plan. It also provides a relative ranking of the type of land or land use that should be considered for application of waste (according to a nutrient management plan) outside of the normal growing season.

The following items need to be considered when planning for waste utilization:

1. Consider the potential problems from odors associated with the land application of animal manures or organic amendments, especially when applied near or upwind of residential or commercial properties;

2. Consider the timing of waste applications. For example, it is preferable to apply wastes on pastures and hayland soon after cutting or grazing, and before re-growth has occurred. Applications on cropland are best scheduled according to planting dates, anticipated nutrient availability and transformation processes, and agronomic needs of the crop.

3. Also consider changes in the form and content of nutrients as a result of land application;

4. Consider the effect of waste utilization on water quality, particularly where a shallow ground water table is present, or in areas prone to runoff. Limit liquid waste application to the volume of liquid that can be stored in the root zone;

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

5. Consider setback distances from environmentally sensitive areas, such as streams, water bodies, sinkholes, wells, surface inlets or rapidly permeable soil areas. When wastes will be applied on sloping land or land adjacent to sensitive resources, consider the need for additional conservation practices to reduce the potential for off-site transport of waste;

6. Consider methods of waste utilization that will minimize the potential for spreading disease. Wastes may contain pathogens and other disease-causing organisms that can affect animal health;

7. Where the metal content of the agricultural waste is of concern, consider analysis of the concentration of metals in the material. Metals can be toxic to beneficial plants and/or crops in high concentrations.

**Additional Considerations for Temporary Waste Field Storage**

When assessing potential locations for temporary stacking of dry animal manure/litter, consider such factors as soil permeability, depth to the seasonal high water table, flooding frequency, and distance to sensitive natural resources such as wells, springs, wetlands, and streams.

Take note of other constraints such as providing access to the site, and maintaining a sufficient distance away from neighboring properties.

Consider whether the storage site will need an impermeable pad or liner under it, based on site conditions and the anticipated frequency of use. If manure/litter will be temporarily stockpiled at the same field location for two or more consecutive years, installation of an impermeable pad or liner should be considered.

Consider proper shaping of the stockpile and maintenance of the covering to prevent leachate or percolation of water through the stack and into the groundwater. Consider the additional runoff from the covering when planning for water management around the stack.

Consider the need for additional conservation practices to protect the resource base at and adjacent to the storage site. Supporting practices may include land shaping, access roads, diversions, waterways, subsurface drains, filter strips, and critical area plantings.

## CRITERIA

**General Criteria Applicable to All Purposes**

All federal, state and local laws, rules and regulations governing waste management, pollution abatement, health and safety shall be strictly adhered to. The owner or operator shall be responsible for securing all required permits or approvals related to waste utilization, and for operating and maintaining any components in accordance with applicable laws and regulations.

The environmental impacts of land-applied wastes shall be minimized by limiting the quantity of waste applied to the rates determined by using the Maryland conservation practice standard for Nutrient Management (Code 590) for all waste utilization.

**Land application of all animal waste in Maryland will be in accordance with a Nutrient Management Plan developed by a Certified Nutrient Management Consultant.** Persons who develop, review or approve plans for nutrient management shall be certified through the Maryland Department of Agriculture (MDA) Nutrient Management Certification Program (including reciprocity agreements) or a certification program acceptable to NRCS Maryland. (Refer to the Maryland Nutrient Management Regulations, COMAR 15.20.04 - Nutrient Management Certification and Licensing.)

Nutrient values of manure and organic amendments shall be determined prior to land application based on laboratory analyses. Manure analyses will be conducted each time a manure storage facility is emptied for each manure source until a reliable trend of nutrient contents has been established for each manure source on each farm. Analyses will be performed through:

1. The University of Maryland Soil Testing Laboratory; or,

2. A testing laboratory whose techniques are consistent with the University of Maryland.

In those cases where a representative manure sample and analysis cannot be readily obtained, an NRCS and/or University of Maryland accept-

able "book value" may be used for tentative planning purposes, only until an actual representative sample can be obtained and analyzed. Book values recognized by NRCS may be found in the Agricultural Waste Management Field Handbook, Chapter 4 – Agricultural Waste Characteristics.

Where municipal wastewater, sludge, septage, or other agricultural waste is a concern, the analysis shall also include the concentration of metals and other constituents in the material as required by the Maryland Department of the Environment.

Where waste materials are to be spread on land not owned or controlled by the producer, the waste management system plan (or CNMP), of which waste utilization is a component, shall document the amount of waste to be transferred and who will be responsible for the environmentally acceptable use of the waste.

Records should be maintained for a minimum of three years; or for a period longer than three years if required by other federal, state, or local ordinances, or program or contract requirements.

**Additional Criteria for Temporary Waste Field Storage**

Temporary stacking of dry animal manure/litter shall be included as part of the overall waste management system plan (or CNMP) component of the conservation plan. The plan map shall show the location of all temporary storage areas, access roads to these areas, setbacks, slopes, surfaces to be graded, necessary cuts and fills, and location of sites subject to pollution such as wells, springs, wetlands, streams, and floodplains. Supporting practices such as access roads, diversions, waterways, subsurface drains, filter strips, and critical area plantings shall be used, maintained, and shown on the plan map, as required.

***Location*** - Waste field storage shall be located:

1. Where access to the manure storage will be practical during periods of inclement weather;

2. Above the floodplain of the 100-year, 24-hour storm;

3. For slopes greater than 3 percent, no farther than 150 feet from the top of a slope, unless a diversion is installed;

4. Outside natural drainage ways;

5. At least 100 feet from wells, springs, wetlands, streams, and ponds, or at least 300 feet from a well when the well is located down gradient from the storage area;

6. Where the seasonal high water table will be no closer than 2 feet below the bottom of the stacked manure/litter;

7. At least 200 feet from neighboring properties;

8. Near natural windbreaks, where possible, to protect the covering from blowing winds; and,

9. As required by state laws and regulations.

***Soils and Foundation*** - Manure/litter may be stockpiled without using an impermeable pad or liner, if it will be:

1. Temporarily stockpiled on an infrequent basis in fields, or in the same field at different locations each year;

2. Applied or transported within 120 days;

3. Placed on high ground with well drained soils and a permeability of less than 6 inches/hour in the upper 40 inches of the soil profile;

4. Placed on locations that allow removal with minimal soil disturbance;

5. Loaded in a manner that effectively removes ALL of the residual manure/litter from the site; and,

For sites that do not meet the above listed criteria, refer to the Maryland NRCS conservation practice standard for Waste Storage Facility, Code 313, "Additional Criteria for Waste Field Stacking Pads."

After the manure/litter is removed, temporary storage sites on cropland shall be planted to a cover crop or other agronomic crop to facilitate nutrient uptake. Temporary storage sites in other locations shall be revegetated with grasses or other permanent vegetation, as appropriate, in

accordance with the NRCS Maryland conservation practice standards for Critical Area Planting (Code 342) or Conservation Cover (Code 327).

***Covering and Shaping*** - All field-stacked manure shall be shaped to minimize percolation of precipitation through the pile. Poultry manure stacked in a conical shape need not be covered. Also, horse manure with a minimum 50:50 ratio of straw bedding to manure may be left uncovered.

All other field-stacked manure may be uncovered if stacked for no longer than 30 days. If 30 days are exceeded, field-stacked manure shall be shaped and covered with opaque plastic or polyethylene sheeting (minimum thickness of 6 mils), or other impermeable and equally strong material.

The cover for the stacked manure/litter shall be free of tears or punctures, and shall be placed over the pile with care to prevent tearing. Weights such as used tires shall be placed over the sheeting to anchor it and prevent tearing during high winds. A trench 12 inches deep shall be constructed around the waste and the edges of the sheeting buried in and through the trench. In lieu of a trench, Jersey barriers or similar materials may be used to secure the cover.

**Additional Criteria to Protect Water Quality**

All waste materials shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies.

Applications of waste materials shall be scheduled, to the extent possible, to match the expected agronomic needs (relative to nutrient uptake) of the crop. In the case of applications made to primarily meet the nitrogen needs of a crop, split applications shall be planned where feasible.

When liquid wastes are applied, the application rate shall not exceed the infiltration rate of the soil, and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application.

Additionally, waste materials shall not be applied on soils that are frequently flooded, as defined by the National Cooperative Soil Survey, during the period when flooding is expected.

Wastes should not be applied to frozen, snow-covered, or saturated soil if the potential risk for runoff exists. The basis for the decision to apply wastes under these conditions shall be documented in the waste management system plan (or CNMP).

All applications including daily hauling shall be consistent with "Timing of Nutrient Application" requirements contained in COMAR 15.20.08.05 and with the guidelines contained in the Maryland Nutrient Management Manual, Section I-D.

When applications must be made outside of the normal periods of nutrient uptake or growing season, these applications shall remain in accordance with an approved Nutrient Management Plan. In the event that off-season applications are necessary, the following hierarchy of land use and cover types shall be followed to minimize the potential loss of nutrients to the environment:

1. Land (<7% slope) with existing vegetative cover, such as pasture and hayland, that is adequate to accommodate applications necessitated by inadequate storage;

2. Land (>7% slope) with existing vegetative cover more than 100 feet from the closest watercourse or other sensitive resources;

3. Land (>7% slope) with buffers at least 50 feet wide between the sensitive resource and the application area, or conservation practices to meet the soil loss tolerance (T).

**Additional Criteria to Provide a Source of Biomass for Energy**

All energy producing components of the system shall be included in the waste management system plan (or CNMP) and provisions for utilization of residues of energy production shall be identified.

Where the residues of energy production will be land-applied for crop nutrient use or soil conditioning, the criteria previously listed above shall apply.

## SPECIFICATIONS

Specifications for waste utilization shall be in keeping with this standard, and shall describe the requirements for applying the practice to achieve

its intended purpose. The waste management system plan (or CNMP), of which waste utilization is a component, shall account for the utilization or other disposal of all wastes produced. All waste application areas shall be clearly indicated on a plan map.

## OPERATION AND MAINTENANCE

Records shall be kept for a period of three years (as required by MDA) or longer, and shall include when appropriate:

1. Quantity of manure and other wastes produced, and their nutrient content*;

2. Soil test results*;

3. Dates and amounts of waste application where land applied, and the dates and amounts of waste removed from the system due to feeding, energy production, or export from the operation*;

4. Crops grown and yields (both yield goals and measured yield)*;

5. Waste application methods;

6. Other tests as applicable, such as determining the nutrient content of the harvested product;

7. Calibration of application equipment.

*Note: These records are required by the State of Maryland as part of a Nutrient Management Plan, and may be maintained in that document, unless program requirements specify otherwise.

The operation and maintenance plan shall include the dates of periodic inspections and maintenance of equipment and facilities used in waste utilization, including temporary coverings used for waste field storage. The plan should include what is to be inspected or maintained, and a general time frame for making necessary repairs.

## SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file, as applicable:

1. Documentation of site visits on CPA-6. The documentation shall include the date, who was present, specifics as to what was discussed (including all alternatives discussed), and decisions made and by whom;

2. If temporary waste field storage is used:

   a. Plan view of the area locating all piles and other practices, as appropriate;

   b. Soils investigation documenting soil texture, depth to high water table, and permeability of the soil.

3. Location where the Nutrient Management Plan is maintained or stored (if not in the same case file);

4. An estimate of the total quantity of waste that is generated or imported to the property. Where flush water, runoff or other materials are added to the waste stream, an estimate of the total quantity of material that is to be stored or handled;

5. An accurate calculation of total storage capacity available to the producer;

6. A balance sheet or other acceptable record to document that waste storage and handling facilities have adequate capacity to safely store the waste between scheduled applications, off-site transfer, or other allowed uses.

## REFERENCES

1. Maryland Department of Agriculture. *Maryland Nutrient Management Regulations.* COMAR 15.20.04 - 15.20.08.

2. Maryland Department of Agriculture, November 1999 (and as amended). *Maryland Nutrient Management Manual.*

3. USDA, Natural Resources Conservation Service, April 1992. *Agricultural Waste Management Field Handbook.*

4. USDA, Natural Resources Conservation Service. *Conservation Practice Standards.* Maryland Field Office Technical Guide, Section IV.

5. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Nutrient Management, Code 590*. Maryland Field Office Technical Guide, Section IV.

6. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Waste Storage Facility, Code 313*. Maryland Field Office Technical Guide, Section IV.